



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Features

- $BV_{CEO} > 20V$
- $BV_{CBO} > 20V$
- $I_C = 3.0A$ High Continuous Current
- $h_{FE} > 400 @ 2A$ and Low Saturation Voltage
- $V_{CE(sat)} < 450mV$ at 3A
- Complementary PNP Type: DIODES™ NK-FZT789B

Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.112 grams (Approximate)

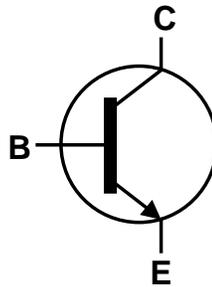
Applications

- Darlington replacements
- Flash gun convertors and battery powered circuits

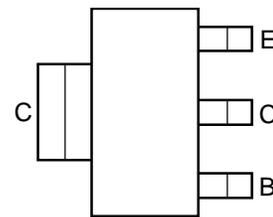
SOT223 (Type DN)



Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	20	V
Collector-Emitter Voltage	V _{CEO}	20	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current	I _{CM}	8	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

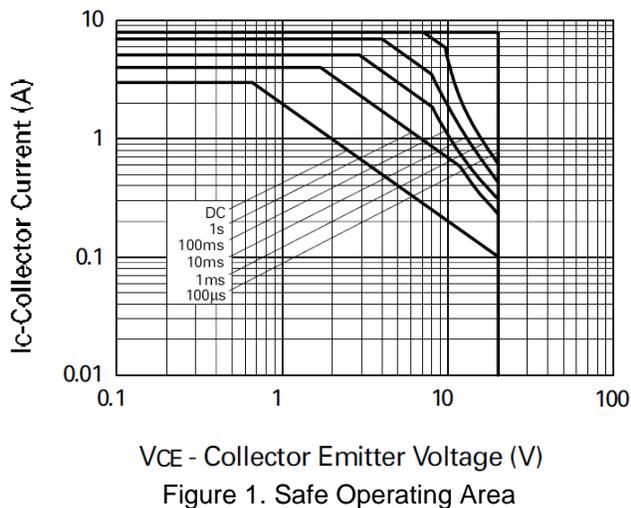
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	3
		(Note 6)	2
		(Note 7)	1.6
		(Note 8)	1.2
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	R _{θJL}	12.9	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge — Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge — Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 50mm × 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 5, except the device is mounted on 25mm × 25mm 2oz copper.
 7. Same as Note 5, except the device is mounted on 25mm × 25mm 1oz copper.
 8. Same as Note 5, except the device is mounted on minimum recommended pad layout.
 9. Thermal resistance from junction to solder-point (at the end of the collector lead).
 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



VCE - Collector Emitter Voltage (V)
Figure 1. Safe Operating Area

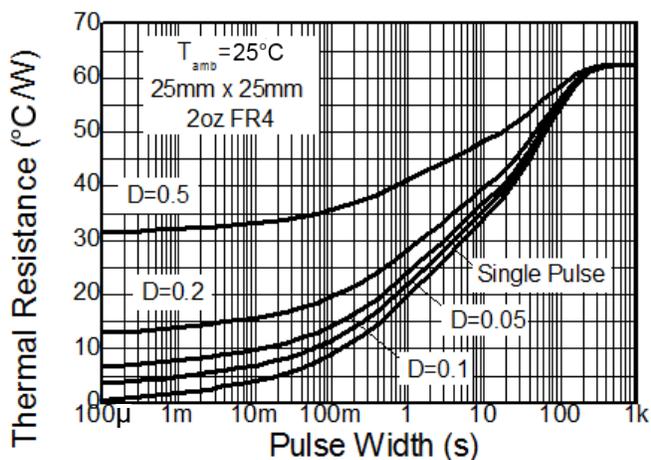


Figure 2. Transient Thermal Impedance

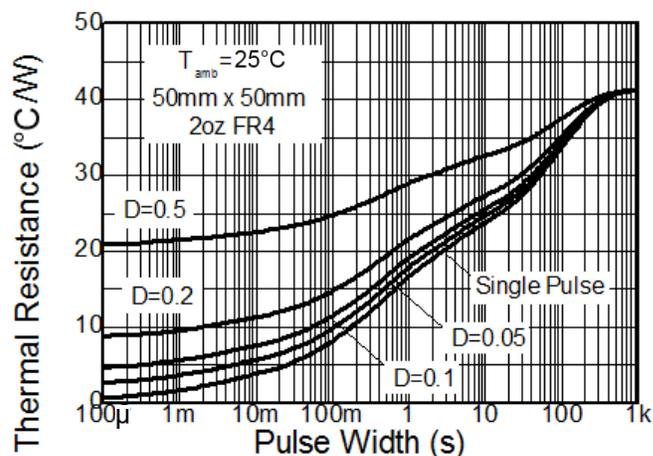


Figure 3. Transient Thermal Impedance

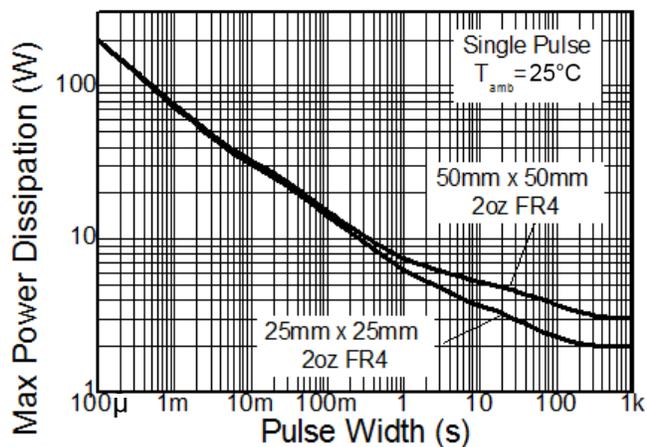


Figure 4. Pulse Power Dissipation

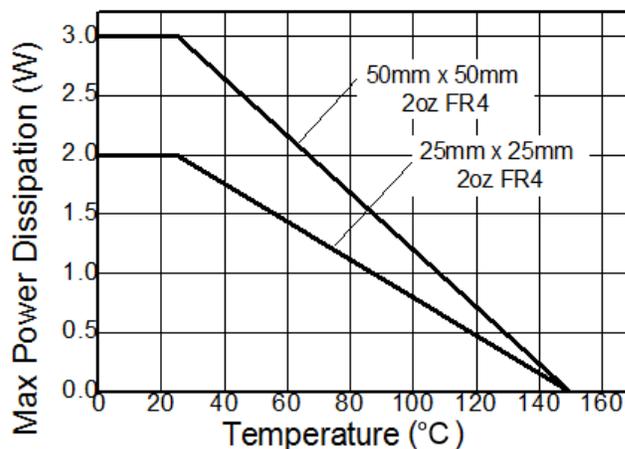


Figure 5. Derating Curve

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	20	—	—	V	I _c = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	20	—	—	V	I _c = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	—	—	V	I _E = 100μA
Collector-Base Cut-Off Current	I _{CB0}	—	—	50	nA	V _{CB} = 16V
Emitter Cut-Off Current	I _{EBO}	—	—	50	nA	V _{EB} = 6V
DC Current Gain (Note 11)	h _{FE}	500	—	—	—	I _c = 0.1A, V _{CE} = 2V
		400	—	—		I _c = 2A, V _{CE} = 2V
		150	—	—		I _c = 6A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	—	—	100	mV	I _c = 0.1A, I _B = 0.5mA
		—	—	500		I _c = 2A, I _B = 10mA
		—	—	450		I _c = 3A, I _B = 20mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	—	—	0.9	V	I _c = 1A, I _B = 10mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	—	—	0.9	V	I _c = 1A, V _{CE} = 2V
Input Capacitance	C _{ibo}	—	200	—	pF	V _{EB} = 0.5V, f = 1MHz
Output Capacitance	C _{obo}	—	16	—	pF	V _{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f _T	150	—	—	MHz	V _{CE} = 5V, I _c = 50mA, f = 50MHz
Turn-On Time	t _{on}	—	30	—	ns	V _{CC} = 10V, I _c = 500mA, I _{B1} = -I _{B2} = 50mA
Turn-Off Time	t _{off}	—	800	—	ns	

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

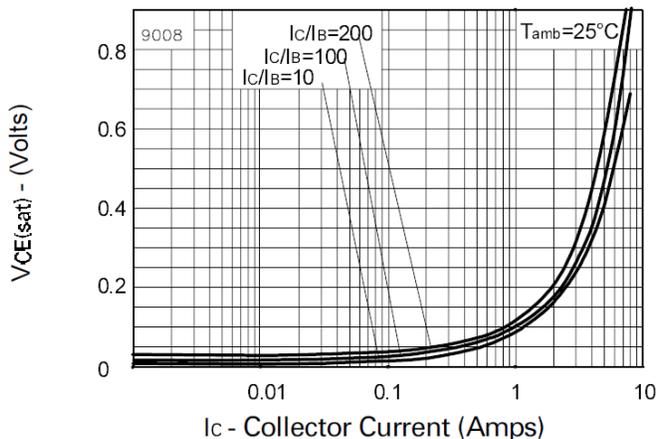


Figure 6. V_{CE(sat)} vs. I_c

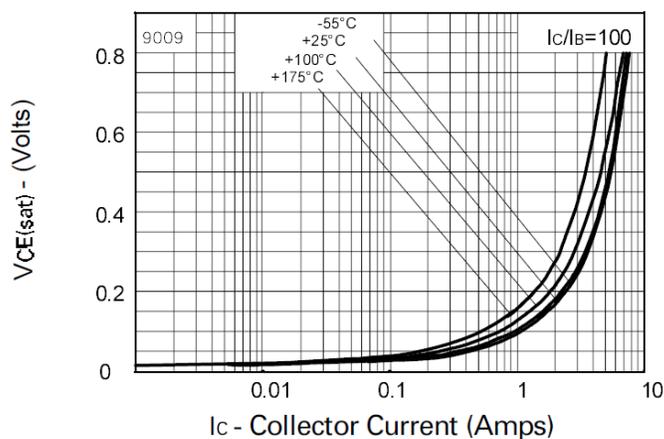


Figure 7. V_{CE(sat)} vs. I_c

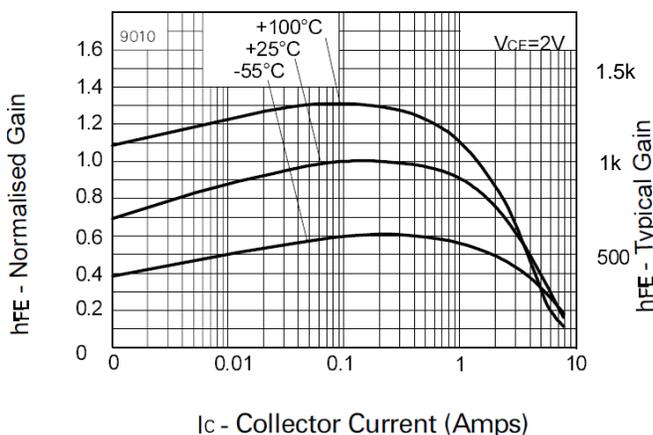


Figure 8. h_{FE} vs. I_c

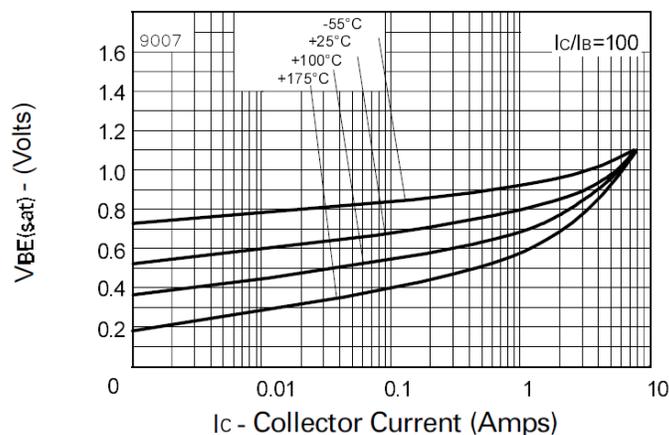


Figure 9. V_{BE(sat)} vs. I_c

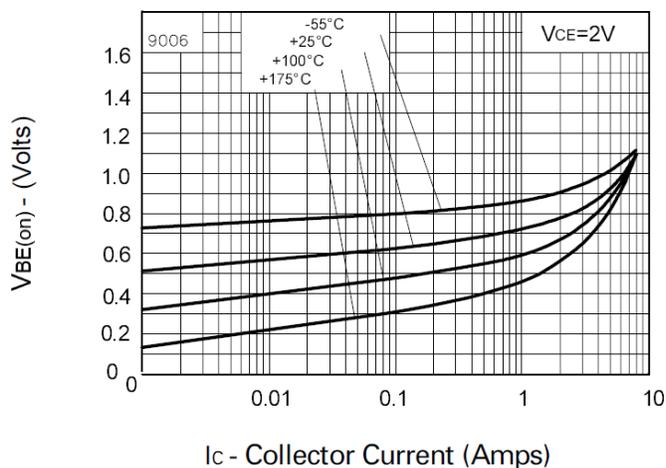
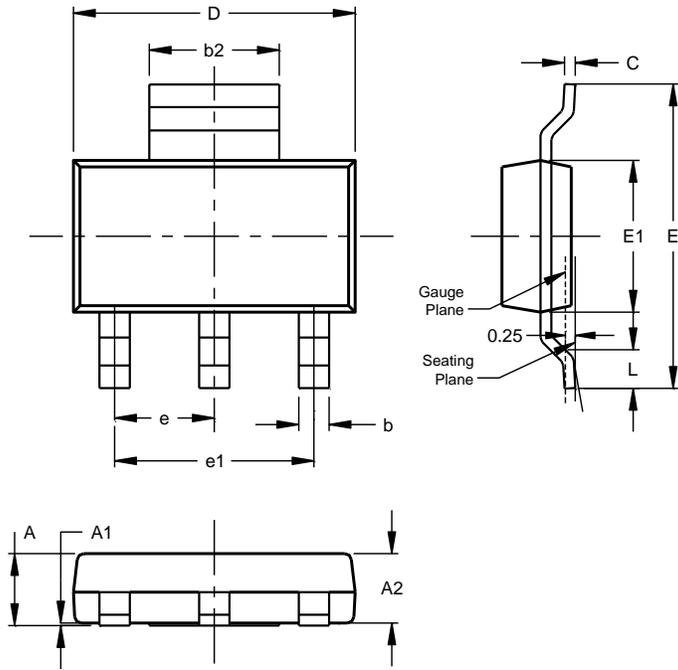


Figure 10. V_{BE(on)} vs. I_c

Package Outline Dimensions

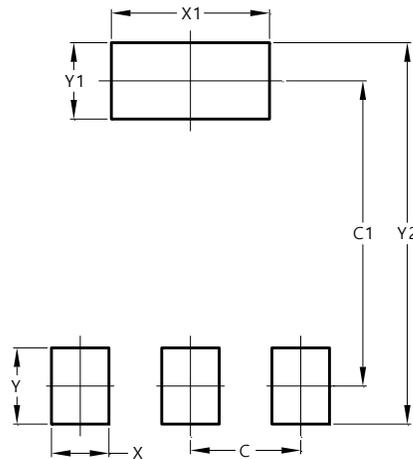
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00